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REMARKS

Claims 1-81 remain pending in the application.

Claims 1-7 and 10-81 were rejected under 35 U.S.C. 102(b) as being anticipated by Bergqvist.

Claims 8-9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Bergqvist.

Applicants respectfully traverse the rejection and request reconsideration of the application after final. No amendments to the claims are presented.

Bergqvist discloses the following process steps:

a) extract the lipids from the seed material with chloroform/methanol for 3 hrs;

b) evaporate the solvent under a stream of nitrogen to recover the oil (total lipid extract);

c) recover the triacylglycerols (TGs) from the total lipid extract using thin layer chomatography (TLC);

d) re-dissolve the recovered TGs in a solvent;

e) perform preparative liquid chromatography (mass detection HPLC) on the dissolved TGs to fractionate the TGs into molecular species;

f) check each of the TG molecular fraction species for purity using light scattering detection high performance liquid chromatography (HPLC).

It is noted that the light scattering detection process in Bergqvist is performed against individual ones of the fractionated molecular species of TGs. In other words, step e) is used to separate the TGs into individual molecular species (for example, 14:0, 16:0, 17:0, etc., as shown in Table 1) as well as make mass detections, and then the light scattering HPLC process is performed in step f) on each individual species to confirm the purity of the mass detection HPLC results of step e). Thus, it is clear that the light scattering HPLC process in Bergqvist is not being used to make an oil content measurement. Rather, it is solely taught for use in making separate individual TG species evaluation (and even more specifically to confirm the results obtained using mas detection HPLC). Thus, Applicants reiterate their previous position that the light scattering HPLC process in Bergqvist does not anticipate the claimed invention for determining oil content of the seed based on scattered and detected light.

Applicants point out that there is a clear distinction between the determination of individual TGs and oil content. For example, it is recognized by those skilled in the art that oil refers to more than just triacylglycerols and includes things such as free sterols, sterol esters, free fatty acids, mono and di-glycerides, tocopherols and some phopholipids. The determination of oil content in accordance with the

present invention takes into account all of these things. Bergqvist's process, on the other hand, will only produce a total TG determination.

It is further noted that the input to the light scattering HPLC process in Bergqvist is a solvent dissolved TG species. Bergqvist teaches in step a) the extraction of lipids from the seed material using a solvent. This solvent is then evaporated in step b) to recover the oil. These two steps are identical to the first two steps of Applicants' method (except for the type of solvent used). However, in Bergqvist, the recovered oil in step b) is not detected using light scattering HPLC. Rather, light scattering HPLC of step f) in Bergqvist is reserved solely for TG species processing. In the claimed invention, the solvent which extracts the oil from the seed is the same solvent which is subjected to evaporation in a stream of gas, and it is the oil which is recovered from that same solvent evaporation which is detected by light scattering. Bergqvist's use of light scattering HPLC on a solvent containing a specific TG species in step f) accordingly does not anticipate the claimed use of light scatting detection on an evaporated solvent which contains the seed extracted oil. In fact, Bergqvist's teaching to perform steps c) through e) before engaging in light scattering HPLC clearly teaches away from the claimed invention.

It is additionally noted that the seed extraction technique disclosed by Bergqvist uses chloroform and methanol. This solvent is well known in the art to extract both polar and non-polar lipid fractions. Applicants teach the use of non-polar solvents (like hexane or petroleum ether) for seed extraction. The reason for this is that Applicants are interested in oil content measurement which those skilled in the art recognize as representing only neutral lipids. The danger of using polar solvents for extraction is that other species such as phenolics, flavanoids and pigments could be co-extracted from the seeds along with the lipids.

Applicants now summarize for the Examiner's benefit some of the distinguishing characteristics between the teachings of Bergqvist and the claimed invention: 1) the claimed invention injects the seed extract straight into the light scattering HPLC device to determine oil content (Bergqvist first isolates lipids, then removes the solvent, then redissolves, then isolates the TGs, then dissolves each TG individually, and finally performs HPLC analysis on individual TGs); 2) Bergqvist's TG determination cannot be equated chemically with an oil content determination; 3) the additional steps in Bergquist used to isolate the individual TGs add significant processing time to the determination in comparison to the straight injection process of the present invention; and 4) the claimed invention uses non-polar extraction solvents which are consistent with making oil content determinations.

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We now direct the Examiner's attention to the independent claims and certain language therein which Applicants believe distinguishes the claimed invention over Bergqvist.

In claim 1, Applicants specifically recite extracting oil from a seed with a solvent. That "said solvent" is then evaporated to form oil particles which are detected using reflected (scattered) light. It is important to note that claim 1 specifically recites that it is the same "said solvent" which is used for seed extraction that is subjected to evaporation and light reflection oil detection. As discussed above, Bergqvist fails to teach or suggest performing the light scattering HPLC by straight injection of the solvent which is used to extract oil from the seed. Rather, the light scattering HPLC is used on individual TG species which are obtained using several solvent related processes. This direct (on the same "said solvent") process as claimed clearly distinguishes over the indirect injection method taught by Bergqvist.

Still further, claim 1 recites that the "determining" step determines "oil content based on the reflected light." As discussed above, Bergqvist uses scattered light detection for the purpose of confirming purity of mass detection HPLC composition of TGs, and TGs are not oil for the reasons recited above. There is no teaching or suggestion for using the detected scattered light to identify "oil content" within the seed which was subjected to solvent-based oil extraction. This oil content determination process accordingly clearly distinguishes over the TG determination of Bergqvist.

Turning next to claim 24, this claim differs from claim 1 with respect to the generic recitation of a sample (as opposed to a seed). Nonetheless, the distinctions over Bergqvist relating to "said solvent" evaporation for light reflection processing and "oil content" determination from the reflected light apply. Claim 24 is accordingly distinguished from Bergqvist.

With respect to claim 27, this claim differs from claims 1 and 27 with respect to the recitation of an agricultural product (as opposed to a seed or sample). Nonetheless, the distinctions over Bergqvist relating to "said solvent" evaporation for light reflection processing and "oil content" determination from the reflected light apply. Claim 27 is accordingly distinguished from Bergqvist.

In claim 30, Applicants recite that a "solvent/oil mixture" is subjected to evaporation and light reflection detection of the contained oil. As discussed above, Bergqvist teaches in step f) the application of light scattering HPLC against a solvent/TG species mixture. Bergqvist accordingly does not anticipate the claimed "solvent/oil mixture" limitation. Applicants further submit that Bergqvist's solvent/TG species teaching does not suggest the claimed "solvent/oil mixture" limitation because the TG separation steps and processes between step b) and step e) clearly teach away from performing an oil based light

scattering HPLC operation. Still further, Applicant again submits that the TG species process taught by Bergqvist fails to teach or suggest the claimed "determining of oil content" limitation. Claim 30 is accordingly distinguished from Bergqvist.

Claim 31 is distinguished from Bergqvist for at least the same reasons as claim 30. Additionally, Applicants note that claim 31 further recites that the "solvent/oil mixture" is introduced into a solvent carrier (i.e., another, separate solvent) to form a processing solvent, and it is this processing solvent which is subjected to evaporation and light reflection detection. There is no teaching or suggestion in Bergqvist for using one solvent to make the mixture with oil and then introducing another solvent. Bergqvist certainly teaches the use of many solvents, but these solvents are separate and are not used in combination with each other and certainly are not used with each other for the light scattering HPLC process where Bergqvist teaches use of only a nitrile:ethanol:isooctane solvent. There is no second introduced solvent beyond that which is used to carry the TG species under examination. Claim 31 is accordingly distinguished from Bergqvist.

Claims 32 and 35 are directed to seed handling and are accordingly distinguished from Bergqvist for at least the same reasons as claim 1. Additionally, Bergqvist fails to teach or suggest the selection of seeds with similar genetic background based on the "oil content" determination (claims 32 and 35) or the growing of such a seed for cross-breeding to introgress a trait (claim 35). Claims 32 and 35 are accordingly distinguished from Bergqvist.

Claims 44 and 45 are directed to seed handling and are accordingly distinguished from Bergqvist for at least the same reasons as claim 1. Additionally, claim 45 is directed to seed selection and is accordingly distinguished from Bergqvist for at least the same reasons as claim 32.

Claims 46, 58 and 70 are directed to apparatus that process a solvent and oil mixture and make an oil content determination based on evaporative light reflection/scattering processing. These claims are accordingly distinguished from Bergqvist for at least the same reasons as claim 30. Claim 70 is additionally directed to the introduction of an additional solvent, and thus is distinguished from Bergqvist for at least the same reasons as claim 31.

Applicants further direct the Examiner's attention to certain ones of the dependent claims and language therein which Applicants believe distinguishes the claimed invention over Bergqvist.

Claims 6, 7, 52, 57, 69 and 78 are directed to the use of non-polar solvents and clearly distinguish over the polar solvent taught by Bergqvist for the reasons discussed above.

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Claims 19 and 20 are directed to the completion of the oil content determination process in a time period which is substantially shorter than the disclosed process time in Bergqvist. For example, Bergqvist teaches spending three (3) hours in performing just the initial lipid extraction. A significant amount of time is then expended in performing TLC and the two HPLC processes. And even with that effort and time expended, the end result is still a TG determination, not an oil content determination. There is no suggestion in Bergqvist for making oil content determinations in such a short amount of time.

In view of the foregoing Remarks, Applicants believe that the Section 102 and 103 rejections to claims 1-81 have been overcome. Allowance of the application is requested.

Respectfully submitted,

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